

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
20 October 2005 (20.10.2005)

PCT

(10) International Publication Number
WO 2005/097808 A2

- (51) International Patent Classification⁷: **C07F 5/00**
- (21) International Application Number:
PCT/US2005/010220
- (22) International Filing Date: 25 March 2005 (25.03.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/556,431 26 March 2004 (26.03.2004) US
- (71) Applicant (for all designated States except US): **LUNA INNOVATIONS INCORPORATED [US/US]**; 2851 Commerce Street, Blacksburg, Virginia 24060 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **GE, Zhongxin** [CN/US]; 1008 Montgomery Street, Blacksburg, Virginia 24060 (US). **DORN, Harry, C.** [US/US]; 101 Fincastle Drive, Blacksburg, Virginia 24060 (US).
- (74) Agents: **DADIO, Susan, M. et al.**; Burns, Doane, Swecker & Mathis, LLP, P. O. Box 1404, Alexandria, Virginia 22313-1404 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

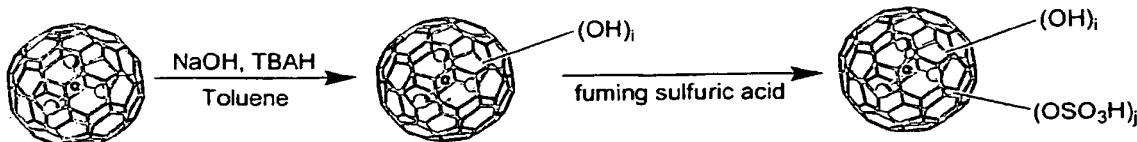
Published:

- without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2005/097808 A2

(54) Title: POLYHYDROXY HYDROGENSULFATED TRIMETALLIC NITRIDE ENDOHEDRAL METALLOFULLERENES



(57) Abstract: Polyhydroxy hydrogensulfated trimetallic nitride endohedral metallofullerenes, can be utilized in a number of applications, for example, as proton conductors in electrochemical devices. The presence of encapsulated metal atoms, preferably trivalent metals including lanthanides, rare earths or IIB group metals, polyhydroxy hydrogensulfated trimetallic nitride endohedral metallofullerenes with properties not found in empty-cage polyhydroxy hydrogensulfated fullerenes.